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As for the imagination, what is it but a faculty operating under laws as rigid as those of physics? As the distinguished ethnographer, Von Hellwald, remarks: "In spite of the endless multiplicity of forms, yet often one and the same or very nearly allied forms recur in localities widely asunder, and this seems to occur most frequently in forms which are peculiarly strange and artificial. We are almost forced to accept the discouraging suggestion of Peschel, that the human faculty of thought is a mere mechanism, which under a given stimulus is always forced to perform the same motion."

LETTERS TO THE EDITOR.

* * * Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.

On request in advance, one hundred copies of the number containing his communication will be furnished free to any correspondent.

The editor will be glad to publish any queries consonant with the character of the journal.

A Physiological Effect of Cave Visiting.

DR. HOVEY's interesting account of a visit to the Mammoth Cave in March, published in *Science* for April 7, 1893, recalled a recent conversation with my father, Dr. C. Fayette Taylor, on the subject of the cave, which he visited in July, 1860. He was particularly struck with, and vividly describes, the physiological effects experienced on emerging from the cave. He made the usual long trip with some fifteen companions, reaching upper air after a stay of about twelve hours under ground. On emerging the sense of smell was intensified to such an extraordinary degree, that most common objects, such as trees, plants, animals, and even people had strong individual odors, mostly unpleasant; about half the party were strongly nauseated and vomited. One tree could easily be distinguished from another by its characteristic odor. This effect lasted about half an hour and then passed off. The guides told him that this was a usual experience. Dr. Hovey alludes to this effect of a sojourn in the cave in a lecture published in the *Bulletin of the American Geographical Society*, March 31, 1891, in the following words: "By contrast with the pure oxygenated air of the cave, the odors of the outside world, of the trees, grass, weeds, and flowers, are strangely intensified and for many delicate natures overpowering." In a letter dated April 11, 1893, Dr. Hovey says: "I have always, or generally, been accustomed to rest at the entrance on emerging, for the reason that neglecting this precaution is apt to be followed by disagreeable consequences. I have known visitors to suffer from nausea and headaches by reason of a too sudden change from the peculiarly pure air of the cave to that of the outside world. The sense of smell is greatly intensified in almost every case."

I judge that this intensification of olfactory perceptions is due to the rarity of olfactory stimuli in the cave; on emergence, in accordance with a physiological law, the perceptive powers for these particular stimuli, having rested, are intensified, so that odors too delicate to make an impression under ordinary circumstances are powerfully felt. By the constant repetition of the ordinary olfactory stimuli this effect passes off, and soon only the stronger odors are registered in consciousness. In other words, consciousness is mainly concerned with the registration of the contrast between the stimulus of the moment and a background of fused and undifferentiated impressions. Ordinarily, sensations are increased by more intense stimulation, but they may also be increased, as in the illustration just given, by varying the background so as to bring ordinary stimuli into stronger relief. That a similar effect has been intensified by heredity is illustrated by Dr. Hovey's remarks on the auditory sensitiveness of the cave fauna. He says in the lecture already referred to: "The tiny [blind] fish are colorless, having cartilage instead of bones, are viviparous, and are so sensitive that if a grain of sand should fall on the water they would dart away with rapidity. Blind crawfish are also found here, whitish, semi-transparent, with remarkably long antennæ and more delicate in

every way than those found in outside streams. These also are highly sensitive and not easily captured."

This agrees with an observation of Professor Cope, quoted in the "Standard Natural History," Vol. III., p. 173. He says the Amblyopses, when swimming near the surface, as is their habit, are "easily taken by the hand or net, if perfect silence be preserved, for they are unconscious of the presence of an enemy, except through the sense of hearing. This sense is, however, evidently very acute, for, at any noise, they turn suddenly downward and hide beneath stones, etc., at the bottom."

HENRY LING TAYLOR, M.D.

New York.

Pre-Historic Remains in America.

IF Professor Thomas, in *Science*, May 5, had really desired to inform readers what my conclusion was in reference to the original home of the Mexican or Uto-Aztecan stock, he would have quoted, not various fragments from earlier studies, but the following from "The American Race," p. 121: "That very careful student, Mr. George Gibbs, from a review of all the indications, reached the conclusion that the whole group came originally from the east of the Rocky Mountain chain, and that the home of its ancestral horde was somewhere between these mountains and the Great Lakes. This is an opinion I have also reached from an independent study of the subject, and I believe it is as near as we can get to the birthplace of this important stock."

What I said of the Mayas was: "The uniform assertion of their legends is that the ancestors of the stock came from a more northern latitude, following down the shore of the Gulf of Mexico."

If Professor Thomas can controvert either of these propositions, I shall be glad to change my views to his.

As for his assertion that I "ought to know" that the shells and copper ornaments found in Tennessee and Georgia "are looked upon by all archaeologists as puzzling objects because of their remarkable departure from the types of the Atlantic slope," I certainly know nothing of the kind, nor does Professor Thomas. Only last summer that most competent archaeologist, Dr. E. Seler, published an article to show that these very objects are so little of a departure from historic Atlantic types that the theory of a relationship to Maya art is in his opinion unnecessary (see *Science*, Nov. 4, 1892).

If Professor Thomas had made himself acquainted with the current literature of American archaeology, he would not have risked such a statement.

D. G. BRINTON.

Philadelphia, May 8.

Tornadoes.

ABOUT five o'clock of the evening of April 24, a peculiar wavy appearance was noticed in the clouds, which were moving north. Every few minutes one or more miniature tornadoes would appear. The little funnels would last twenty or thirty seconds, others formed only to be destroyed shortly afterwards.

The whole time was about fifteen minutes, when the upper layers of clouds became more or less mingled with the lower layers. The barometer had been falling all day. The same evening there were two destructive tornadoes in Missouri and a heavy wind-storm at Paxton, Ind.

E. M. DANGLADE.

Vevay, Ind., April 29.

Pivotal Sounds in Recollection.

IN 1884 I published the statement that in the endeavor to recall some forgotten word or name that a remarkable tendency existed to substitute another word or name having, somewhere in its construction, a letter corresponding to one in the desired word or name. For example, Cavendish suggests itself, or rather may do so, when one is trying to recollect Van Antwerp, and so on; the V being the pivot upon which both names revolve, apparently, in the memory. In addition to this I find, at least in my own experience, an inclination to swing these memory efforts around the R sound more frequently than with other instances; for example,